FieldSecured: A Chrome Browser Extension for Forms Phishing Prevention

By Fahad Alarefi
University of Oregon, Department of Computer Science

Abstract

The increasing use of the Internet has led many users to become the victim of browsing phishing. One phishing technique is using Chrome's form Autofill feature to trick the user into thinking that they are only submitting the information they see, while in reality, more information are being submitted through hidden fields. Our solution, FieldSecured, is a browser extension that doesn't let the user submit any information until they have seen all the fields being submitted.

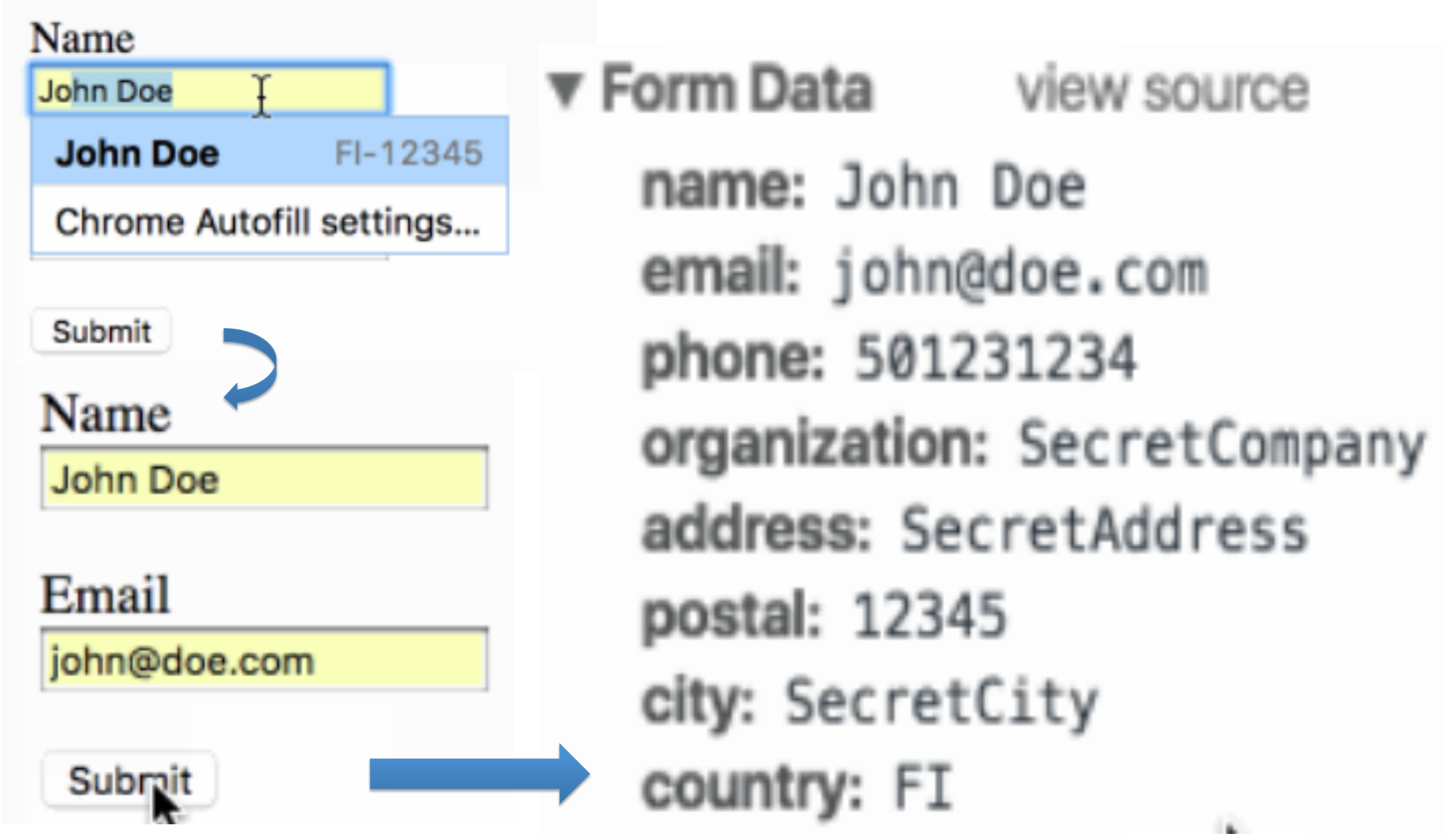
Goals

FieldSecured will help the user in achieving better caution to forms phishing by following 3 goals:

- Convenience for the user; Our extension will not disrupt the user's daily browsing
- Low use of resources; Since it will be working continuously in background, then it should consume low resources.
- High accuracy of identifying phishing forms; It should be able to find most types of malicious forms

Problem

A Chrome security, or UI design, flaw was discovered in 2017 by developer Viljami Kuosmanen. When Autofill is used, the feature might fill hidden fields resulting in leaking personal information without user's consent.



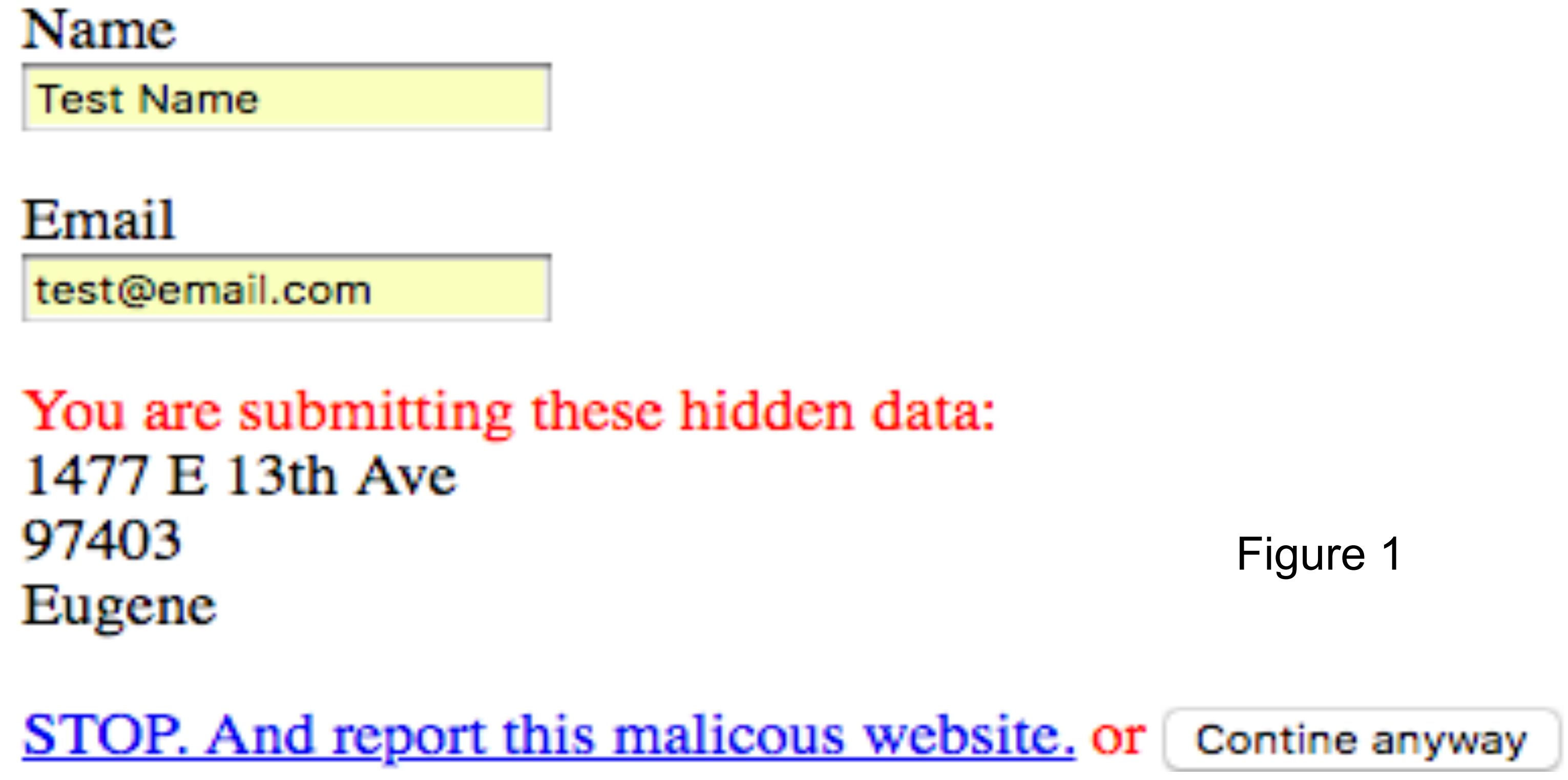
Name
John Doe
John Doe FI-12345
Chrome Autofill settings...
Submit

Name
John Doe
Email
john@doe.com
Submit

▼ Form Data view source
name: John Doe
email: john@doe.com
phone: 501231234
organization: SecretCompany
address: SecretAddress
postal: 12345
city: SecretCity
country: FI

What information had the website received from form submission

Our Solution



Name
Test Name
Email
test@email.com

You are submitting these hidden data:
1477 E 13th Ave
97403
Eugene

STOP. And report this malicous website. or Contine anyway

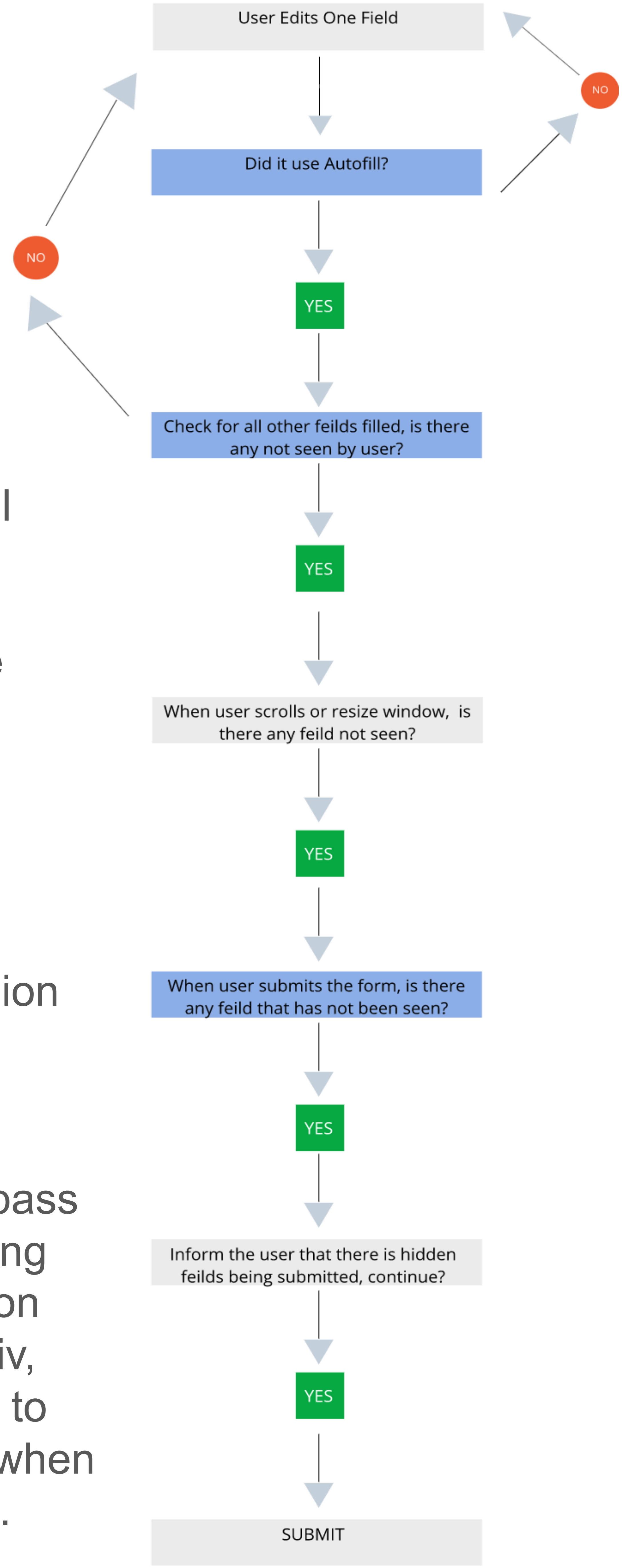
Figure 1

The extension will work continuously in the background, and when Autofill is used and user have not seen all information, show the above.

Implementation and Limitation

Implementation

When a user edits a text field, then the extension checks whether Autofill is used or not. In case it was, then it will keep track of every unseen field. When user resizes or scroll window, it will recheck all fields for visibility. And if there is suspicion, then print message in Figure 1



User Edits One Field
Did it use Autofill?
NO
YES
Check for all other feilds filled, is there any not seen by user?
NO
YES
When user scrolls or resize window, is there any feild not seen?
YES
When user submits the form, is there any feild that has not been seen?
YES
Inform the user that there is hidden feilds being submitted, continue?
YES
SUBMIT

Limitation

Although the extension works perfectly with many forms of text inputs, a website developer can overpass this solution by putting the submission button outside the form's div, then use JavaScript to fire the submission when the button is clicked.